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Who Is at Risk for Childhood Lead Poisoning?



Tennessee Department
of Health

*Prepared by Martha Keel, Professor
and Janice McCoy, former Research Associate,
Family and Consumer Sciences*

UR|Extension

SP 605-E

► **The health effects of lead**

Lead is a metal that does not have any value to the human body. The Centers for Disease Control and Prevention (CDC) estimate that nearly one million children in the United States have elevated blood lead levels (BLL). Blood lead levels as low as 10 micrograms per deciliter (10 µg/dL) can interfere with a child's ability to learn. Elevated blood lead levels have been associated with deficits in cognitive and behavioral development. The child may have a decreased IQ, shortened attention span and could be diagnosed as hyperactive.

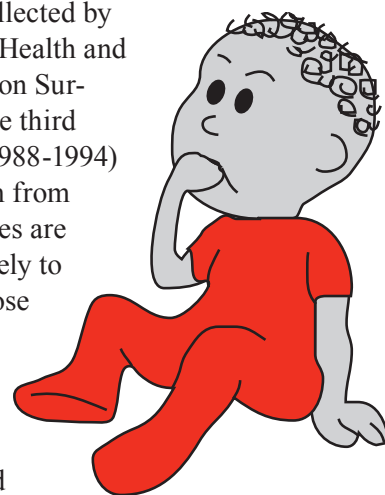
Other adverse health effects include growth impairment, reduced hearing acuity, iron-deficiency anemia and altered bone formation. At the molecular level, the human body does not distinguish between calcium and lead. A child's bones may absorb the lead instead of calcium. Very high levels of lead (>80 µg/dL) are not common. However, when these levels do occur, the child can suffer a seizure, lapse into a coma or even die.

Adults can be impacted by lead poisoning. Long-term exposure to even small amounts of lead may increase lead in bones. Some studies indicate that lead competes with calcium for absorption in bones.

As a result, two things may happen. First, less calcium is absorbed into bones. Inadequate calcium intake results in loss of calcium from bones, which increases the risk of osteoporosis. Second, when calcium is released, so is lead. Lead may move back into the bloodstream, where it damages tissues and organs. Additionally, adults may develop hypertension, anemia and kidney disease as a result of lead poisoning,

► **Which children are at most risk?**

National data are collected by the CDC's National Health and Nutrition Examination Survey (NHANES). The third NHANES survey (1988-1994) showed that children from lower income families are eight times more likely to be poisoned than those from higher income families. African-American children are five times more likely to be poisoned



than white children. Of those children identified with elevated blood lead levels of 20µg/dL or greater, 83 percent of these children are enrolled in Medicaid/ TennCare programs. Children under the age of 6 are at high risk because their bodies are still developing. Also, the frequent hand-to-mouth activity of young children increases risk of lead ingestion.

► **Lead absorption pathways**

Lead can be absorbed through three primary pathways: gastrointestinal tract, respiratory system and fetal uptake. Lead is absorbed via the gastrointestinal tract from the ingestion of lead-contaminated food, beverages, soil or dust. Children may also swallow paint chips or flakes. Always wash children's hands with warm, soapy water before eating, after playing and at bedtime.

Through the respiratory system, a child can inhale lead particles. Small particles are more easily inhaled. Children are especially vulnerable to lead dust from deteriorated paint in poorly maintained older housing. A child should not be near repainting and remodeling projects that disrupt old painted

surfaces, especially windows and doors, where lead dust is more prevalent.

During pregnancy, lead crosses the placenta and is absorbed by the fetus in utero. Since the majority of lead is stored in bone, much like calcium, lead can be mobilized from the expectant mother's bone into her bloodstream. From the bloodstream, the lead will be absorbed by the developing fetus.

► **Nutrition is essential**

Children should be served three healthy meals and two or three healthy snacks every day. Lead is less likely to be absorbed if the child's stomach is full. Also, if the bones have a good supply of calcium, they are less likely to absorb lead. Foods high in calcium, iron and Vitamin C are very important.

Cold water should be used for drinking and cooking. Always prepare infant formula with cold water. Consult a registered dietician (RD) for meal plans through your local health department or health care provider.



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